

stomach. The coarse fish—bleak, burbot, pike, bream, ruff, and lamprey—were found to be much less harmful, and roach and perch quite innocent of spawn-eating.

In an exhaustive account of the herring collection at the Göteborg Museum, Hjalmar Broch gives an analysis of 354 specimens according to locality, size, age, sex, and maturity, accompanied by a brief dissertation upon fish-scale investigation by means of which not only age, but also, in the case of the herring, racial characteristics can be determined. The same writer reports upon the distribution and age groups of Gadidae, Pleuronectidae, Homarus, &c., in the Gullmar Fiord.

Questions of wider interest than Baltic Sea biology are touched upon in an appendix which sets forth the scheme, recommended by the Swedish members of the International Council for the Investigation of the Sea at their meeting in Lübeck in 1906, for the establishment of an international agreement for the purpose of protecting and increasing the plaice stock of the North Sea and neighbouring seas. According to the present state of this fishery, and in the light of the knowledge of the life-history of the plaice, which the current researches have already afforded, it is stated that there is a need for the regulation of fisheries by international agreement, based upon scientific investigations, hydrographical and biological, as well as statistical. A size-limit below which plaice should be forbidden to be landed is the essential remedy recommended, and it is suggested that a progressive limit from 28 to 33 cm. should be agreed upon as the standard for plaice caught by deep-sea fishing, while coastal fisheries should have their special limits according to local conditions. The volume concludes with an appreciative review of the work done by those participating in the International Fishery Investigations, and suggestions as to the trend of future researches.

A. E. H.

NOTES.

THE council of the Röntgen Society has now decided to act upon the advice of the committee appointed in 1906 to consider the possibility of preparing a standard for the measurement of radio-activity. This committee recommends that "The γ -ray ionisation from 1 mg. of pure radium be regarded as a standard, and called a unit of radio-activity." The council has deputed Mr. C. E. S. Phillips to prepare a set of three substandards of RaBr_2 , and these are now maturing. By the kind cooperation of Prof. E. Rutherford, comparison will be made with a specimen of the purest RaBr_2 at the Victoria University, Manchester. The quantity of radium in other specimens will be capable of accurate measurement by comparison with the substandards. It is anticipated, therefore, that by this means the exact description of medical, physical, or other work with radium will be facilitated, and that the possibility of fraud in the sale of expensive radium preparations will be eliminated. The council proposes to lend the substandards to any competent person desiring to measure the amount of radium in his possession, or to arrange for authoritative tests to be made. For further particulars application should be sent to the honorary secretary of the Röntgen Society, at 20 Hanover Square, London, W.

A FORTNIGHT ago a disastrous railway accident happened in Algeria, and on Saturday last the sad news was announced that the Englishman killed had been identified as Mr. Joseph Lomas, the lecturer in geology at Liverpool University. Mr. Lomas was a well-known British

geologist, and was a specialist on Triassic geology; he was making a visit to southern Algeria on behalf of the committee of the British Association appointed at Dublin to investigate the desert deposits of the Biskra oasis in reference to the origin of the New Red Sandstone. Mr. Lomas received his chief scientific education at the Royal College of Science, and in 1884 or 1885 settled at Liverpool as one of the peripatetic science masters of the Liverpool School Board. He soon joined the Liverpool Geological Society and the Liverpool Marine Biological Committee, and gradually took a leading place among the naturalists of that city. He was president of the Liverpool Geological Society in 1896-8, and was recently re-elected for a second term of office, that he might be its president at the approaching jubilee of the society. Though he retained his position under the Liverpool School Board and local education committee, he was appointed in 1887 special lecturer in geology in Liverpool University, and though never on the regular staff, he was responsible for the university teaching in physical geography and geology. He was for nine years one of the secretaries of the geological section of the British Association, and was the recorder for the last two meetings; his trustworthy service and never-failing tact will be greatly missed from that section. After his appointment at Liverpool he began work on the marine Bryozoa of that district; he discovered the presence of calcareous spicules in the Ctenostomata, and was thus led to the suggestion that that group was descended from Bryozoa with a well-developed skeleton. He also prepared a valuable report on the floor deposits of the Irish Sea. Subsequently, he worked mainly at the Trias; he made many interesting additions to our knowledge of the system, and inspired much of the work upon it by the members of the "Trias Committee." He was an enthusiastic champion of the desert origin of the English New Red Sandstone, and defended that theory in papers in the Transactions of the Liverpool Geological Society and the *Geological Magazine*. He was also keenly interested in glacial geology, and made several visits to Switzerland to study existing glaciers. His tragic and early death will be mourned by the wide circle of British geologists who knew his lovable character and his sound and suggestive scientific work.

By the will of the late Lord Rosse, the sum of 1000*l.* is bequeathed to the science schools fund of Trinity College, Dublin. The famous Rosse telescope and all Lord Rosse's scientific instruments, apparatus, and papers are left to his sons in order of seniority successively, whom failing, to his brothers successively, whom failing, to the Royal Society, London; 2000*l.* is left upon trust for the upkeep of the telescope.

THE Convocation week meeting of the American Association for the Advancement of Science and affiliated societies will be held in Baltimore from December 28 to January 2. On January 1 a celebration will be held of the one hundredth anniversary of the birth of Darwin and of the fiftieth anniversary of the publication of the "Origin of Species." The celebration will consist of a morning and afternoon programme of addresses by prominent naturalists, to be followed by a dinner in the evening, at which further addresses will be delivered.

THE Home Secretary has appointed a Departmental Committee to inquire into the sufficiency of the existing regulations relating to the storage, use, and conveyance of petroleum spirit, and to report what further precautions, if any, are in their opinion desirable as tending to diminish the dangers attendant thereon. The committee

is constituted as follows:—Sir Henry Cunynghame, K.C.B., chairman, Sir Boverton Redwood, F.R.S., Major Cooper Key, and Mr. James Ollis. The secretary to the committee is Major T. H. Crozier, to whom correspondence may be addressed at the Home Office, Whitehall, S.W.

THE Geological Society of Glasgow, instituted in 1858, has now entered the fifty-first year of its existence. The council has made arrangements to celebrate the event by holding a jubilee meeting in Glasgow University on January 28. Sir Archibald Geikie, K.C.B., F.R.S., the senior member of the society, has promised to be present and deliver an address. Sir Donald MacAlister, K.C.B., Dr. Teall, F.R.S., director-general of the Geological Survey of Great Britain, Dr. Horne, F.R.S., Mr. B. N. Peach, F.R.S., and other eminent men of science will take part in the proceedings. A history of the work of the society, with biographical notices of prominent members, is being prepared under the editorship of the secretaries, Messrs. P. Macnair and F. Mort, who hope to issue the book by the end of the year.

HARVARD UNIVERSITY has lost the senior member of her faculty by the death, on December 9, of Dr. Wolcott Gibbs, emeritus Rumford professor of the application of science to the useful arts. Dr. Gibbs, who was a son of George Gibbs, the mineralogist, was born at New York in 1822. After graduating as M.D. at the College of Physicians and Surgeons in that city, he pursued his studies under Heinrich Rose at Berlin, under Liebig at Giessen, and under Regnault at Paris. From 1849–63 he occupied the chair of physics and chemistry at the College of the City of New York. He held his active professorship at Harvard from 1863–87. During this latter period he distinguished himself by his researches in light, heat, and organic chemistry, particularly in reference to complex inorganic bases and acids. His investigations of the platinum metals are also well known. In 1886 Prof. Gibbs was elected foreign secretary of the U.S. National Academy of Sciences, and in 1895 its president. He rendered conspicuous public service on the executive committee of the Sanitary Commission during the Civil War, and was U.S. commissioner to the Vienna Exposition of 1873. He was one of the founders, in 1863, of the Union League Club, which gave valuable help to the Union cause in the struggle with the Confederacy.

THE first number of a very attractive monthly magazine of *Travel and Exploration* has just been published under that title by Messrs. Witherby and Co. The fundamental note of the magazine is that of human interest in the places, peoples, and products of the world. Travel in all its aspects—by land, water, or air—will be dealt with for the benefit of the general reader and the inspiration and guidance of the young explorer. Exploration is a comprehensive word, and can be applied to studies of the heavens above as well as the earth beneath, but apparently the magazine is to be limited to accounts of geographical exploration. In the first number Sir Clements Markham appeals to the spirit of adventure, and Lieut. Trolle describes the Danish expedition to north-east Greenland, which led to valuable scientific results gained at the price of the lives of the leader Erichsen and his two companions. Mr. L. C. Bernacchi predicts that Peru will gradually become one of the richest countries of the world, and Mr. E. S. Bruce describes the progress in the construction and performance of dirigible balloons. There are other contributions upon travel in the Balkans, photography for travellers, and New Guinea, and the pages are brightened with excellent illustrations. The magazine should appeal to a wide circle of readers.

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ANOTHER remarkable *aéroplane* flight was accomplished by Mr. Wilbur Wright at Auvours, near Le Mans, on December 18. The flight lasted 1h. 54m., and the distance covered is estimated to have been more than ninety miles. The flight took place around a triangular course marked with flags at a measured distance apart, and the official record of the number of revolutions around this course gives the distance traversed as sixty-two miles, but the actual track of the *aéroplane* was often far beyond the measured triangle, thus making the distance much greater. By his achievement, Mr. Wright will probably win the Michelin trophy of 800*l.* for travelling the greatest distance in the air before December 31. He has won the prize of 40*l.* offered by the *Aéro Club* of Sarthe for the first *aéroplane* flight at an altitude of 100 metres. The subjoined table, from Saturday's *Daily Mail*, shows the progress made in motor flight with heavier-than-air machines during the past five years:—

Date.	Name	Place	Miles	Yards	Min.	Sec.
¹⁹⁰⁵						
Sept. 28	Wright Bros. ...	Dayton ...	11	125	18	8
Sept. 29	Wright Bros. ...	Dayton ...	12	—	19	35
Oct. 3	Wright Bros. ...	Dayton ...	15	25	25	5
Oct. 4	Wright Bros. ...	Dayton ...	20	75	33	17
Oct. 5	Wright Bros. ...	Dayton ...	24	20	30	13
¹⁹⁰⁶						
Nov. 11	M SantosDumont	Pais ..	—	230	21	18
¹⁹⁰⁷						
Oct. 8	Herr Wels	Trautenau...	—	350ft.	—	—
Nov. 7	H. Farman	Paris ...	—	1300	—	—
¹⁹⁰⁸						
Mar. 22	H. Farman	Paris ...	2	1540	—	—
May 14	Wright Bros. ...	Manteo ...	6	—	0	—
June 23	M. Delagrange...	Milan ...	10	1105	18	30
July 6	H. Farman	Paris ...	11	—	20	10
Sept. 5	M. Delagrange...	Issy ...	15½	—	30	—
Sept. 5	W. Wright	Le Mans ...	16½	—	19	50
Sept. 9	O. Wright	Fort Meyer	51½	—	56	—
Sept. 9	O. Wright	Fort Meyer	37½	—	62	13
Sept. 10	O. Wright	Fort Meyer	—	—	65	42
Sept. 11	O. Wright	Fort Meyer	—	—	70	30
Sept. 12	O. Wright	Fort Meyer	45	—	74	20
Sept. 21	W. Wright	Le Mans ...	58	—	91	25
Sept. 30	H. Farman	Mourmelons-le-Grand	24	—	36	—
Oct. 6	W. Wright	Le Mans ...	42	—	64	26
Dec. 18	W. Wright	Le Mans ..	95	—	113	59

THE current issue of the *Fortnightly Review* contains an article by Dr. William S. Bruce on the aims and objects of modern Polar exploration. Supposing the object of an expedition to be a detailed investigation of the North Polar basin, Dr. Bruce gives a sketch of the equipment of such an expedition, the method of procedure, the *personnel* of the staff, and the relations which should subsist between the leader of the expedition and the master of the ship. This investigation is, Dr. Bruce says, the only piece of work in the North Polar regions that remains to be done on an extensive scale, though there is much Arctic work required in other directions. The Beaufort Sea, the islands and channels of the north of the American continent, offer a splendid field for topographical, hydrographical, biological, geological, and other research. Turning to South Polar regions, it is remarked that almost everything south of 40° S. requires a thorough investigation and overhauling, and vast stores of information are to be gathered from both sea and land. It is, in Dr. Bruce's judgment, a study of the sub-Antarctic and the Antarctic seas that requires investigation in the first place, including an exploration and definition of the southern

borders of those seas. More than anything that is required, the paper says, is a new expedition on the same lines as the *Scotia*, and Dr. Bruce is prepared to organise such an expedition as soon as funds are provided. He gives an outline of the way such an expedition might be conducted and the work it might accomplish.

WE have been favoured with an advance copy of the forty-seventh report of the Yorkshire Naturalists' Union, containing an account of the proceedings at the forty-sixth annual meeting held at Halifax on December 14, 1907, and of the general working of the society during the past year. Full reports are given of the condition of the bird-life of the county, which are for the most part satisfactory, although the numbers of the great grebe on Hornsea Mere have been sadly reduced by the ravages of egg-collectors.

At a recent meeting of the North Staffordshire Field Club, Mr. F. W. Ash read a paper (of which we have been favoured with a typed copy) on the evolution of the cetacean tail-fin, in which it is attempted to rehabilitate the generally discredited theory that this structure includes vestiges of the hind-limbs as well as the tail itself. The chief argument brought forward in support of the theory appears to be based upon the expanded form and horizontal position of the cetacean flukes, which is likened to the complex formed by the hind-limbs and tail in seals. The tendinous structures in the whale's flukes are considered to represent limb-tendons.

WE have received from the publishers, Messrs. Vinton and Co., of Chancery Lane, a copy of the "Live Stock Journal Almanac" for 1909, which is a wonderfully good shilling's worth. The calendar portion contains ample space for entering the dates of birth of farm and other animals, while the rest of the volume is devoted to illustrated articles on different breeds of domesticated animals in 1908 and kindred subjects, most of these articles being by well-known specialists. Thus Shorthorns are discussed by the late Mr. John Thornton, while Mr. A. C. Beck treats of shire horses. Special interest attaches to an article by Sir Walter Gilbey on live stock a hundred years ago, where much information will be found with regard to the history and rise of many breeds.

THREE out of the four papers in No. 3 of the seventh volume of the *American Journal of Anatomy* are devoted to the Mammalia (other than man), Dr. Henry Fox treating of the pharyngeal pouches and their derivatives, Mr. L. W. Williams describing the later development of the notochord, and Mr. W. A. Baetjer discussing the mesenteric sac and thoracic duct in pig-embryos. In the second of these the author finds that the primitive vertebra consists of undifferentiated mesenchyma, which never undergoes longitudinal segmentation, while the cartilage of the actual vertebra arises, not from a primary condensation of mesenchyma, but from a secondary condensation following a loosening of the dense tissue of the scleromere, or primitive vertebra. This secondary condensation of the vertebrae and intervertebral discs gives rise to pre-cartilage. At this time the notochord expands slightly in each vertebra, this being suppressed at the commencement of chondrification, when most of the notochordal tissue is forced into the intervertebral discs, where it forms the nucleus pulposus. Primarily cellular and epithelial, the notochordal tissue eventually becomes cellular, and then closely resembles cartilage.

THE December number of the *Popular Science Monthly* is one of unusual interest to naturalists, as it contains

the full text of Prof. W. Ridgeway's paper, read at the last meeting of the British Association, on the application of zoological laws to man; an article on the aspects of modern biology, by Prof. T. D. A. Cockerell; and one on the great Permian delta of Texas and its wonderful extinct vertebrate fauna, by Dr. E. C. Case. The remains of these animals are believed to have been carried down by the Permian rivers in flood-time and entombed in the mud of the delta. Restorations of several of the reptiles are given, and it is interesting to note that there appear to have been two distinct types of the "fin-backed" group, one of which (*Dimetrodon*) was carnivorous, while the other (*Naosaurus*) was probably omnivorous. The latter has perhaps the most wonderful dentition of any known animal, the incisor teeth being sharp and chisel-shaped, such as might be suited for cutting vegetable substances, while behind these are five pairs of sharp triangular cutting-teeth, these being followed by simple cones suited to holding a struggling victim. On the palate and the opposing portion of the lower jaw are heavy plates of bone covered by short, stumpy teeth of a type found in mollusc-eating fish. In the author's opinion, *Naosaurus* was probably omnivorous, but instead of possessing a dentition of a generalised type, like that of man or a pig, it had a special set of teeth for each kind of food.

THE ichthyosaurs of the Trias, and more especially those of North America, form the subject of an elaborate monograph by Dr. J. C. Merriam, published as the first part of vol. i. of the *Memoirs of the University of California*. For several years past the author has been working at these reptiles, and in the present memoir we have the result of his labours. After a discussion of their distribution, the author proceeds to point out in what respects the Triassic representatives of the Ichthyopterygia differ from their successors of the Jurassic and Cretaceous epochs. These differences consist, for the most part, of less special adaptation to the exigencies of a purely aquatic mode of life, thereby bringing them into closer connection with less specialised land reptiles. What their terrestrial ancestor may have been is, however, still unknown; but it probably existed at least as early as the Lower Trias. By the middle portion of that period we find an undoubted aquatic form—*Cymbospondylus*—which retains, however, sufficient indications of affinity with a land form to give a clue to the origin of the group. This reptile, it may be presumed, had abandoned the shore as a regular dwelling-place, but still resorted thereto on occasion, and probably swam in shallow water in place of frequenting the open sea. In contrast to this we have the highly specialised representatives of *Ophthalmosaurus* and the closely allied, if not identical, *Baptanodon*, which were evidently adapted to play the part in the Jurassic oceans of the whales of the present day. Even these, however, display great simplicity of structure in all parts of their organisation except those specialised for swimming, and it is thus abundantly evident that the ichthyosaurs trace their ancestry to an extremely generalised type of reptile, while it is equally clear that the group is one of the oldest in its class.

THE whole of the November issue (vol. liii., part i.), comprising 181 pages of text, is devoted to a paper by Prof. A. A. W. Hubrecht on the early ontogenetic phenomena in mammals, and their bearing on our interpretation of the phylogeny of the vertebrates, a paper to which it is impossible to do adequate justice in the space at our command. Naturally, the placenta and its modifications

loom very large in this communication, and it is noteworthy that the author regards the diffuse placenta, such as that of the lemuroids, as a specialised and simplified rather than a primitive type. The latter position, on the other hand, is claimed for the zonary placenta of the Carnivora, and it is noteworthy, in connection with the view that the creodonts are related to the mammal-like reptiles, that the author sees evidence of a placental relationship between marsupials, carnivores, and insectivores. Further, he expresses the belief (p. 132) "that the Didelphia furnish very conclusive evidence of their being very specialised descendants of placental mammals." This, of course, is in direct opposition to the views of Prof. J. P. Hill. As regards the Primates, the author is of opinion that they are widely sundered from the Lemuroidea, herein differing *in toto* from the recently expressed views of Messrs. Standing and Elliot Smith. It may be mentioned that *Metachromys*, which the author still includes in the Primates, was regarded by Prof. H. F. Osborn in 1904 as an armadillo. The most startling part of the paper is, however, the proposal to divide vertebrates into the three groups of Cyclostomata, Chondrophora, and Osteophora, the first comprising the lampreys, the second the sharks and rays, and the third the whole of the remaining groups. A further suggestion is that the ganoid Polypterus, and perhaps also the lung-fishes, is the descendant of terrestrial tetrapodous ancestors, and the further suggestion is hazarded that a similar origin may be claimed for many teleostomous fishes.

THE announcement is made by the present editors of the *Botanische Zeitung* that at the close of this year they will withdraw from that office, and will, with the co-operation of Prof. L. Jost, start a new monthly journal, *Zeitschrift für Botanik*, to be published by the firm of Gustav Fischer in Jena. It is proposed to include original articles, reviews, and a summary of new literature in each part. Messrs. Gustav Fischer also announce that they are undertaking the publication of a new medical journal, *Zeitschrift für Immunitätsforschung und experimentelle Therapie*, that will consist of two parts, obtainable separately, the one devoted to original communications, the other to reviews.

PROF. W. TRELEASE has published a useful, although not fully determinate, note on the two species *Agave rigida*, Miller, and *Agave angustifolia*, Haworth. The first binomial has been applied by more than a dozen systematists to agaves of different kinds, but it appears that the original type named by Miller has to be re-discovered, and the author suggests a habitat between Venezuela and Yucatan. The discussion of *Agave angustifolia* leads to the view that this species includes *Agave lurida*, a common fence plant to-day in St. Helena, *Agave Wightii*, and other species that have received distinct appellations. The paper, with illustrations of the two species, is published in the nineteenth annual report of the Missouri Botanical Gardens.

It is reported by Miss T. Tammes in the *Recueil des Travaux botaniques Néerlandais* (vol. v.) that in the species of *Dipsacus* a chromogen exists which on warming gives rise to a blue colouring matter; to the chromogen the name "dipsacan" is given, and the colouring matter is called "dipsacotin." The formation of dipsacotin is somewhat similar to the formation of indigo in the case of species of *Indigofera*. It is produced by the splitting up of dipsacan either by heating in the presence of moisture or by the action of benzin. Dipsa-

can occurs in all parts of the plant, especially in the growing region; it has been found in all genera of the *Dipsacaceæ* that have been examined, but is most abundant in species of *Dipsacus*.

THE quarterly issue of the *Trinidad Bulletin* (October) is an excellent number, containing much information, original and extracted, on the agricultural crops in Trinidad and adjacent islands. An article by Mr. A. W. Bartlett deals with cocoa-nut plantations and the preparation of copra. Mr. T. Thornton discusses the prospects for cotton cultivation in Tobago. Cotton of the "Marie Galante" type has been cultivated, but the Sea Island variety has not received much attention. Hints are provided on the propagation of cedar and cyp—*Cordia Gerascanthus*—seedlings for planting up areas; the latter requires more attention in the nursery, but will thrive on poor soil, and furnishes very good constructional timber.

APART from the information regarding trees and shrubs, the notes on Continental parks and gardens communicated by Mr. W. J. Bean to the *Kew Bulletin* (No. 9) will serve to direct attention to various horticultural and sylvestral localities that may with advantage be included in a Continental trip. At Tervueren, not far from Brussels, there is a comparatively new arboretum extending over 300 acres for the cultivation, in geographical groups, of such exotic trees as are sufficiently hardy. Within easy reach of Gouda are situated the nurseries of Boskoop, where the peaty soil provides an ideal home for rhododendrons, but where Japanese maples, wistarias, and many other valuable plants also luxuriate. The gardens at Herrenhausen and Sans Souci, the nurseries of Vilmorin at Verrières and Les Barres, of Lemoine at Nancy, of Späth near Berlin, and of Hesse at Weener, all famous horticultural centres, are briefly described.

DR. JURITZ discusses the underground waters of Cape Colony in recent issues of the *Agricultural Journal of the Cape of Good Hope*. He lays stress on the fact that an adequate water supply would completely alter the agricultural potentialities of the country, besides being of importance for all steam users, particularly railways, and then proceeds to set out a number of analyses of waters collected from different parts of the colony. The Table Mountain and Stormberg series were found to yield the purest waters, while the Uitenhage, Dwyka, and Bokkeveld formations gave rise to the most saline. Calcium chloride occurred in some cases, and sodium carbonate was found in the waters of the Middle and Upper Beaufort and Stormberg series, rendering the water quite unfit for agricultural purposes.

IN his "Vocabulary of Malaysian Basket-work," the late Dr. O. T. Mason, head curator of the anthropological department of the United States National Museum, made a notable advance towards a more scientific treatment of this important industry. Dr. W. L. Abbott has recently presented to the museum a large collection of baskets from Malaysia. This is now being studied in comparison with the extensive series obtained among the American Indian tribes and in the Philippines. To secure a scientific treatment of the subject it was found necessary to define accurately the terms applied to the various stages of technique and to the materials used in the processes of manufacture. Dr. Mason's glossary, all the more important articles of which are illustrated with excellent drawings, will do much to secure future accuracy of description and definition. Probably, for the present at least, his nomenclature will be accepted in describing the characteristics of the various groups of basketry among the lower races throughout the world.

THE National Museum of the United States has made a new departure in the formation of series of exhibits to illustrate the main religions of the world, a scheme which had its origin at the Chicago Exhibition of 1891. In pursuance of this idea, collections have been made to illustrate the ceremonies of the various Christian Churches, Brahmanism, and Buddhism. We have now, under the editorship of Messrs. C. Adler and I. M. Casanovich, a catalogue of a collection of Jewish ceremonial objects which is of considerable interest. It seems to be an amplification of a similar catalogue issued in 1901, which was confined to a collection of articles lent for exhibition by Hadji Ephraem Benguiat. It contains accounts, with good illustrations, of many curious and beautiful objects with which few but members of the Jewish community are familiar. Particularly deserving of notice are the veils of the Holy Ark, which are fine examples of embroidery; the mantles and wrappers of the Torah scrolls; some graceful hanging lamps; phylacteries and amulets; vessels used in the Passover service; implements employed in ritual, sacrifice, and circumcision. The collection, besides its ritualistic and artistic importance, possesses considerable interest for anthropologists.

THE publication of a new guide to the anthropological department at South Kensington, issued by the trustees of the British Museum, and sold at the modest price of 4d., throws an unpleasant light upon this series of exhibits. While the admirable new shilling guide to the Egyptian galleries occupies 325 pages, and contains 233 plates and other illustrations, thirty-one pages and sixteen photographs exhaust the anthropological series. Though not calculated to excite interest among those to whom the subject is unfamiliar, the guide, as might have been expected from the author, Mr. Lydekker, seems to be generally accurate. It is rather confusing, however, to divide the Dravidians of southern India into Telugus, Tamils, Malayalims, and so on, because these are linguistic, not ethnological, terms; and to speak of the first of these groups as if it were confined to the northern Circars is inaccurate. Possibly it is only from this corner of the tract occupied by the Telugu-speaking people that specimens are at present available. The inadequacy of the collections as they stand may be measured by the fact that while the attention of anthropologists has been in recent years attracted to the Pagan races of the Malay Peninsula by the great work of Mr. Skeat, they seem to be represented in the museum by a single photograph of a Sakai. When the Bureau of Ethnology gets to work these shortcomings in the national collection will doubtless be remedied; but in the meanwhile, Dr. Bowdler Sharpe is quite justified in remarking that in recent years the anthropological series has not increased so rapidly as is desirable, and in expressing a hope that the publication of this guide-book may stimulate public interest and induce British colonial officials and travellers to endeavour to supply the deficiencies in this important series.

THE Survey Department, Egypt, has issued its Meteorological Report for 1906, consisting, as before, of two parts:—(1) hourly observations and means for Helwan Observatory, to which the records of a self-registering electrograph are now added; (2) climatological, rainfall, and river-gauge observations at a large number of stations, with a chronicle of the chief weather conditions of each month. Rainfall at the Egyptian stations was in slight defect, but over the Sudan plains the excess was about 22 per cent. The Nile presented several features of interest during the year; these have been discussed by Captain Lyons in a separate publication.

THE *Annuario* of the Messina Observatory for 1907 has been received. We have previously directed attention to the useful work carried on by Prof. G. B. Rizzo and his small staff; meteorological observations made at several hours daily, with means and extremes, are given for the chief station, together with monthly and annual summaries for temperature, rainfall, &c., for a number of provincial stations. Particulars of earthquake phenomena registered at Messina and other places are also collected and discussed by Prof. Rizzo personally. In the year 1906 the director of the Potsdam magnetic observatory proposed to the Italian Government the establishment of a magnetic station in the south of Italy, as part of an international programme for the special study of that subject. For this purpose Messina has been selected as a suitable locality, thus making a useful addition to the study of terrestrial physics at the important observatory attached to the University of that city.

THE *Neue Denkschriften* of the Swiss Society of Natural Sciences, vol. xlii., contains a useful discussion of the climate of Davos by Dr. Hugo Bach. Observations were commenced by the society in 1867, but are not quite continuous; the station is situated in a broad valley, at an altitude of 5118 feet, and owing to its surroundings the climate is of a much more continental type than is usual at ordinary mountain stations. The most important factor is the low pressure, corresponding to the altitude, as it affects to a considerable extent the conditions of radiation and temperature. The difference of absolute humidity between Davos and the lowlands is very great, especially during winter, and under these conditions the readings of the solar radiation thermometer on bright January days often record a temperature considerably above 100°, while the screen thermometer reads below 14° F.; this fact is naturally of very great importance to invalids. The absolute range of shade temperature between 1867 and 1905 is given as 110° F., the extreme readings being 84°·4, in July, 1900, and -25°·6, in January, 1905. The average percentage of possible sunshine is given as:—winter, 53·9; spring, 50·7; summer, 54·2; autumn, 56·1. The average annual rainfall amounts to nearly 36 inches; the wettest months are from June to September.

AN account of the first portion of the work on the gas thermometer which has been in progress in the geophysical laboratory of the Carnegie Institution at Washington since 1904 under the charge of Messrs. Day and Clement appears in the November number of the *American Journal of Science*. The constant-volume nitrogen in platinum-iridium thermometer is used, and the range of the instrument has been increased by enclosing the bulb in a gas-tight bomb containing nitrogen at the same pressure as that in the bulb. The expansion of the material of the bulb was determined to within $\frac{1}{2}$ per cent., and the unheated space between the bulb and manometer reduced to about one-third of its least previous value. The authors give the following melting points as accurate to within half a degree:—zinc, 418°·5; silver, 958°·3; gold, 1059°·3; copper, 1081°·0 C.

THE important series of papers on fluorescence and phosphorescence which have appeared in the *Physical Review* during the last two years from the pens of Profs. Nicholls and Merritt have shown that the present theories of these and kindred phenomena are quite inadequate, and that Stokes's law that the wave-length of the light sent out by a fluorescent body was greater than that of the exciting radiation, is not correct. These facts have led Prof. de Kowalski to put forward in the October

number of the Bulletin of the Academy of Science of Cracow a theory which will at the least serve as a good working hypothesis. It is based on the corpuscular theory of matter, and assumes that amongst the systems of electrons which constitute the atoms and molecules, there are a number in a state such that a small increment of energy will render them unstable, and one or more electrons will be shot out of the system. These are in turn supposed to enter systems in which the electrons are capable of executing oscillations without becoming unstable. It is these electrons which give out the fluorescent light when the former systems are rendered unstable by the incidence of radiation on them. The author shows that this theory is in keeping with the known facts of fluorescence and phosphorescence.

MESSRS. LEITZ AND CO. have put on the market a universal projection apparatus designed in accordance with the suggestions of Prof. Kaiserling. We have examined this apparatus, and find it most complete. It is available for projection on the screen under a variety of conditions, viz. by transmitted light for both lantern and microscopical work, and by incident light for the projection of woodcuts and natural objects. The special feature of the design consists in the ease with which the change can be made from one mode of projection to another. For episcopic projection it is arranged that the object may either lie horizontally on the table or be in a vertical position. Thus, if it be desired to project on the screen part of a hospital patient, the subject is simply placed at the side so that the part in question may be illuminated by the lamp and completely reflected by the mirror. The electric lamp employed is one of the type which this firm is adapting to several purposes. The carbons are at right angles to one another, the positive one being horizontal and lying along the optic axis. With this arrangement the full crater becomes operative in producing useful light. The result is considerably greater efficiency, a power of 10,500 candles being obtainable with a current of 30 amperes. It is unnecessary to state that the optical part possesses the excellence of this firm's work. The lantern condenser is sufficiently large to illuminate a half-plate transparency, and the whole of it can be simultaneously projected on the screen. For microscopic projection both objectives and projection eye-pieces are quickly changed by revolving carriers. For the lower power objectives the entire field is in focus at once; it is only in the case of the difficult projection with $1/12$ th inch (oil immersion) that the peripheral regions are blurred. At present there is no polarising device, but this is under design. The entire apparatus stands inside a curtained frame, which prevents the escape of light into the room except through the lens. It stands on the floor, with the optic axis about 144 cm. from it.

HAZELL'S Annual for 1909 has been received. The volume includes much information of scientific interest, and is a valuable, concise record of progress in many departments of intellectual, industrial, and social activity.

MESSRS. SIEMENS BROTHERS AND CO., LTD., have issued a convenient self-opening pocket diary for 1909. In addition to the usual calendar notes and diary, the book contains useful tables and illustrations of various dynamos and other machines made by Messrs. Siemens.

In an article in the Johns Hopkins Hospital Bulletin for November, Dr. Peyton Rous describes the course of physiological pathology which is given in the school of medicine of the University of Michigan. It extends over

three hours a day during three weeks, and includes the pathology of vascular, cardiac, and respiratory disturbances.

THE fourth quarterly bulletin, for the year 1906-7, of the results obtained during the periodic cruises and in the intermediate periods, has been issued by the Conseil permanent international pour l'Exploration de la Mer. The bulletin deals with the following points:—condition of the atmosphere; the temperature and salinity of the surface water; the temperature, salinity, density, &c., of seawater at different depths; oxygen, nitrogen, and carbon dioxide dissolved in sea-water; and plankton. The bulletin is published by Messrs. A. F. Høst and Son, of Copenhagen.

THE recent address delivered by Mr. Rudyard Kipling to the students of the medical school of the Middlesex Hospital, at the opening of the present session, has been published by Messrs. Macmillan and Co., Ltd., in the form of a booklet bound in limp cloth, at the price of 1s. net. The title of the little book is "Doctors," and, in addition to the address, the book contains as frontispiece a photograph of Mr. Kipling and a preface describing the work of the hospital, written by Mr. Reginald Lucas. We notice that the book is being sold for the benefit of the Middlesex Hospital.

THE 1909 number of "Whitaker's Almanac" is the forty-first annual issue. It is difficult to imagine what one would do without this indispensable book of reference, which has again increased in size and usefulness. Among new articles which have been included we notice those dealing with the navigation of the air and the radio-telegraphic convention, while the following interesting features will continue to appeal to students of science:—progress of astronomical science, the year's weather in the British Isles, the storms and floods of the year, and the earthquakes and volcanic eruptions, the year being in each case that ending on October 31, 1908.

OUR ASTRONOMICAL COLUMN.

MOREHOUSE'S COMET, 1908c.—A further discussion of the photographs of Morehouse's comet, taken at Juvisy, is published by M. Flammarion in the December number of the *Bulletin de la Société astronomique de France* (p. 513).

M. Flammarion reproduces further photographs, and shows that, while the main features of the tail are explicable by the Maxwell-Bartoli laws of light-pressure demonstrated experimentally by Lebedew, there are other features which point distinctly to the operation of other causes. For example, the photograph of October 15 shows the now well-known dislocation of the tail, at some distance from the head, which might be due to the interference of meteoritic matter. On the photograph of October 17, however, there is no definite dislocation, although there is distinct evidence that the tail, as a whole, suffered some retardation in respect to the motion of the nucleus. Several possible explanations are offered, with full reserve, for this phenomenon. One is that the æther may have a density which is not homogeneous; another is that the sun is constantly repelling matter into interplanetary space, and that this matter would retard the masses of tenuous vapours forming the tail of the comet. A third explanation is that most generally accepted, viz. that the retardations and dislocations are probably caused by the interference of masses of meteorites with which space is probably peopled.

A note in the same journal (p. 534) announces that MM. le Comte de la Baume Pluvinel and Baldet have, since the publication of their preliminary paper in the *Comptes rendus*, obtained many more photographs of the